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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
NGUYEN, LONG P	
ART UNIT	**PAPER NUMBER**
2616	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/619,369	TON ET AL.	
	Examiner	Art Unit	
	Long P. Nguyen	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/13/2004, 7/10/2007*.-
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Balachandran (US 2004/0208183) in view of Chow (US 6,771,966).

As for claim 1, Balachandran shows a method for bandwidth allocation for a wireless network, comprising the steps of: using a matrix of interlink interference **[0051],** Balachandran shows the mobile station feds SNR information back to the base station scheduler but do not shows the scheduler explicitly have an interference matrix. However, Chows shows and interference matrix **(Col. 14, Table 2)**. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the mobile system of Balachandran with interference matrix in order to eliminate mutually exclusive links.

Balachandran shows a list of links' bandwidth requests to schedule link activities to obtain non-collision transmissions **[0044]**; wherein bandwidth needed by said links to carry actual traffic over a specific time period is represented as a set of link bandwidth

requests (**[0046] Note: the mobile station communicate with the base station in time slot, thus it is inherent traffic are carried over a period of time**); wherein bandwidth requests are expressed in units of credits **[0065]**; and wherein a credit is a unit assigned to said bandwidth requests to maintain fair bandwidth distribution between said links **[0066]**; and prorating bandwidth granted for each link based on said link's requested bandwidth **[0051]**, total requested bandwidth in said wireless network **(Figure 1)**, and network capacity **[0069]**.

As for claim 2, and 13, Balachandran shows, further comprising the steps of: providing a centralized node in said wireless network for coordinating substantially all network activities **(Figure 1, Base station #115)**.

As for claim 3, and 14, Balachandran shows wherein said hub comprises: a list of credit request tokens, wherein each token represents a directional link that needs bandwidth **([0065] Note: "Token count are updated for the scheduled user...", It would be inherent Balachandran stored the Token count value would be equivalence to a "list", [0066])**. An interference matrix; a topology matrix for defining valid links that can transmit/receive data using a matrix of interlink interference **[0051],** Balachandran shows the mobile station feds SNR information back to the base station scheduler but do not shows the scheduler explicitly have an interference matrix. However, Chows shows and interference matrix **(Col. 14, Table 2)**. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the mobile system of Balachandran with interference matrix in order to eliminate mutually exclusive links.

As for claim 4 and 15, Balachandran shows, said hub **(Figure 1, Controller #118, Note: A Hub receives multiple input and sent multiple output. The controller of Balachandran performs the function of the Hub)** collecting information from individual nodes **[0051]** and list of credit tokens **[0065], ([0065] Note: "Token count are updated for the scheduled user...", It would be inherent Balachandran stored the Token count value would be equivalence to a "list")** and constructing said interference matrix, topology matrix, therefrom **[0051],** Balachandran shows the mobile station feds SNR information back to the base station scheduler but do not shows the scheduler explicitly have an interference matrix and topology matrix. However, Chows shows and interference matrix **(Col. 14, Table 2)**. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the mobile system of Balachandran with interference matrix in order to eliminate mutually exclusive links.

As for claim 12, An apparatus for bandwidth allocation for a wireless network, comprising: Balachandran shows a method for bandwidth allocation for a wireless network, comprising the steps of: using a matrix of interlink interference **[0051],** Balachandran shows the mobile station feds SNR information back to the base station scheduler but do not shows the scheduler explicitly have an interference matrix. However, Chows shows and interference matrix **(Col. 14, Table 2)**. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the mobile system of Balachandran with interference matrix in order to eliminate mutually exclusive links.

Balachandran shows a list of links' bandwidth requests to schedule link activities to obtain non-collision transmissions **[0044]**; wherein bandwidth needed by said links to carry actual traffic over a specific time period is represented as a set of link bandwidth requests (**[0046] Note: the mobile station communicate with the base station in time slot, thus it is inherent traffic are carried over a period of time**); wherein bandwidth requests are expressed in units of credits **[0065]**; and wherein a credit is a unit assigned to said bandwidth requests to maintain fair bandwidth distribution between said links **[0066]**; means for prorating bandwidth granted for each link based on said link's requested bandwidth **[0051] (Figure 1, Scheduler #119)**, total requested bandwidth in said wireless network **(Figure 1)**, and network capacity **[0069]**.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claim 5 - 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Rath (US 2005/0068902).

As for claim 5, Rath shows a bandwidth allocation method for a network, comprising the steps of: sorting credit request tokens in descending order of a product

of requested credits and degree of interference $\alpha(I_{ij}, L)$, where L is a set of links requesting credits **[0133]**; picking a first token having a largest product, wherein said first token is a first candidate link of a set of links to be allocated credit for a first round; eliminating all other tokens from said first round that cannot be active due to said first candidate link's activity **[0134]**; walking down a list and picking a next eligible token, wherein said next eligible token comprises a second candidate link of said set of links to be allocated credits for a second round **[0135]**; eliminating all other tokens from said second round that cannot be active due to said second candidate link's activity **[0135]**; and continuing until said list of links is exhausted; producing a set of links that can be active at a same time $L_1=[I_1, I_2, \ldots, I_n]$ **[0136]**.

As for claim 6, Rath shows further comprising the steps of: letting β_{Ii} be requested credits of link I_j, wherein an amount of credits allocated to each element of set L_1 is $Y1=\min[\beta_{I1}, . \beta_{I2}, \ldots, . \beta_{In}]$ **[0136]**; adjusting said requested credits for every element in L_1: $\beta_{Ii}= \beta_{Ii}-.Y_1$; and removing tokens which have zero requested credits from said list of tokens **[0136]**.

As for claim 7, Rath shows further comprising the step of: adjusting a degree of interference of affected links, due to the fact that some tokens have been removed **[0137]**.

As for claim 8, Rath shows further comprising the step of: repeating all foregoing steps until said list of tokens is empty **[0138]**.

As for claim 9, Rath shows wherein a list $(L_1, Y_1), (L_2, Y_2) \ldots (L_k, Y_k)$ results **[0139]**.

As for claim 10, Rath shows further comprising the steps of: prorate said list to attain a final schedule; letting S be a total resource of a network in terms of credit; and letting $X_i\ Y_i{*}S//.\Sigma^{0,k}Y_j$ **[0139]**; wherein said list $(L_1, X_1), (L_2, X_2) \ldots (L_k, X_k)$ represents how said links are organized into sets of concurrent active links and how much resource each set of links is supposed to get **[0139]**.

As for claim 11, Rath shows further comprising the step of: broadcasting said list $(L_1, X_1), (L_2, X_2) \ldots (L_k, X_k)$ to all nodes in said network **[0139]**.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Shibutani (US 6,940,824).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Long P. Nguyen whose telephone number is (571)-272-9740. The examiner can normally be reached on Monday - Thursday 7:30 - 5:00 EST Alternate Friday 7:30-4:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached on 571-272-7629. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Long Nguyen

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